AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior listings and versions of claims in this application.

1 – 32 (Canceled)

33. (Original) A minimally invasive drug delivery system for transdermally delivering a medicinal fluid into a patient, comprising:

(a) a handheld control unit comprising a housing, a processor, a display electrically coupled to said processor, a keypad electrically coupled to said processor, a memory electrically coupled to said processor; a medicinal fluid reservoir, a medicinal fluid outlet in fluid communication with said medicinal fluid reservoir, and an actuator that develops pressure to force the medicinal fluid from the medicinal fluid reservoir and through the medicinal fluid outlet for infusion into the patient, said actuator being electrically coupled to and controlled by the processor;

(b) a disposable cartridge, said disposable cartridge comprising a housing, and an array of microneedles through which the medicinal fluid is infused into the patient; and

(c) a fluid line having a distal end and a proximal end, said proximal end being connected to said medicinal fluid outlet, and said distal end being coupled with said disposable cartridge to provide fluid communication between the medicinal fluid outlet and the disposable cartridge.

34. (Original) The minimally invasive drug delivery system of Claim 33, wherein each individual microneedle of said array comprises:

(a) a generally conical-shaped body having a beveled, non-coring tip, said tip being sharp and able to pierce tissue;

(b) said conical body further having a broad base formed of a substrate at an opposite end from the tip; and

(c) a fluid channel extending through the conical-shaped body, providing fluid communication between said broad base and said tip.

35. (Original) The minimally invasive drug delivery system of Claim 34, wherein a height of the microneedle, which is defined as a distance from said broad base to said tip, is within a range from about 50 μm to about 100 μm.

36. (Original) The minimally invasive drug delivery system of Claim 34, wherein a height of each microneedle, which is defined as a distance from said broad base to said tip, is substantially less than a width of said broad base.

37. (Original) The minimally invasive drug delivery system of Claim 34, wherein a ratio of a height of each microneedle, which is defined as a distance from said broad base to said tip, to a width of said broad base ranges between about 1:1 to about 1:2.

38. (Original) The minimally invasive drug delivery system of Claim 33,

(a) further comprising a data cable, said data cable having a proximal end and a distal end, said proximal end of the data cable being connected to said handheld control unit, such that said data cable is electrically coupled to said processor, said distal end of the data cable being electrically coupled to said disposable cartridge; and

(b) said disposable cartridge further including an ultrasonic transducer array that produces an ultrasonic signal directed into target region within a body of a patient and receives a reflected ultrasonic signal from within the body of the patient, producing an output signal indicative of a condition of the target region, said ultrasonic transducer array being electrically coupled to said data cable through which the output signal is conveyed, said processor responding to the output signal and indicating to a user on the display that said disposable cartridge is disposed adjacent to a desired region within the body of the patient.

39. (Original) The minimally invasive drug delivery system of Claim 33, wherein said disposable cartridge further comprises at least one spring element that applies a biasing force to said array of microneedles, causing the microneedles to penetrate a dermal layer of a patient.

40. (Original) The minimally invasive drug delivery system of Claim 38, wherein said disposable cartridge further comprises a flow sensor for monitoring a flow rate of said medicinal fluid and producing a flow signal indicative thereof, said flow sensor providing the flow signal to the processor through the data cable.

41. (Original) The minimally invasive diagnostic system of Claim 40, wherein said array of microneedles comprises a silicon substrate having a first surface on which said array of microneedles is formed, and a second surface on which said flow sensor is formed.

42. (Original) The minimally invasive drug delivery system of Claim 33, wherein said disposable cartridge further comprises a valve for controlling a flow of said medicinal fluid into a patient.

43. (Original) The minimally invasive drug delivery system of Claim 33, wherein said medicinal fluid reservoir comprises a housing, a self sealing elastomeric membrane defining one

portion of said medicinal fluid reservoir, and a sub-micron filter that prevents said medicinal fluid from exiting said medicinal fluid reservoir until said actuator develops a pressure that acts on said medicinal fluid.

44. (Original) The minimally invasive drug delivery system of Claim 33, wherein the medicinal fluid reservoir is removable from the handheld control unit and replaceable with a disposable diagnostic cartridge for use in obtaining a sample of a biological fluid from a patient, said disposable cartridge comprising a housing and an array of microneedles, a sensor being provided that when in contact with the sample of the biological fluid, produces a signal indicative of a characteristic of said biological fluid, said sensor being adapted to electrically couple with said processor to provide the signal to the processor for diagnostic processing.